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Original Paper

Effect of a 12-Week Greek Traditional Dances Program on the Development of Kinesthesis and Dynamic Balance in School-aged Children

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Abstract

The purpose of the present study was to examine the effect of a Greek traditional dances program on the development of kinesthesis and dynamic balance in school-aged children. For this purpose seventeen children, six boys and eleven girls, pupils of elementary school, with their age ranged from 6 to 10 years, took part in the study. All the children received a 12-week program of Greek traditional dances at a frequency of one lesson per week, for 90 minutes. Data collection included pretest and posttest measurements of the kinesthesis and dynamic balance for all the children. Kinesthesis was measured by the kinesthesiometer (Lafayette Instrument Co.) and dynamic balance was measured by the stabilometer platform (Lafayette Instrument Co.). For data analysis, descriptive analysis and the non-parametric tests Wilcoxon of the SPSS ver. 18.0 for windows were used. The level of significance was set to $p<0.05$. The results showed that after the 12-weeks program of Greek traditional dances there was a significant improvement in the kinesthesis ($z=-3.01$, $p<0.01$) and the dynamic balance ability ($z=-3.29$, $p<0.01$) of the children. In conclusion, a program with Greek traditional dances with music accompaniment, could lead to significant improvements in children's abilities, kinesthesis and balance.

Keywords

dance, proprioception, stability, elementary school children

1. Introduction

Kinesthesis is the sensory perception of movement. In its simplest form, kinesthesis is the awareness of movement and body position. Kinesthesis happens when the brain gets feedback from muscles and ligaments about how the body is moving (Gabbard, 2004; https://www.vocabulary.com/dictionary/kinesthetic). Kinesthetic perception is a complex system and, therefore, hard to separate into either a physiological or psychological construct. Within kinesthetic perception are five sub-categories of perception/awareness. They include body awareness, spatial awareness, directional awareness, vestibular awareness and rhythmic awareness. Within sport and physical activity, research tends to focus on vestibular and spatial awareness (Gabbard, 2004). The kinesthetic perception is the ability to determine the body postures and its parts in space, the power required for the muscles to be shrunk, control of direction and distance required during performance (Baumgartner & Jackson, 1995). Kinesthetic awareness is the ability to perform movements without thinking of the pattern due to proprioception feedback (Lewis, 2016), even in the absence of vision. Dancers, in order to define this sense, might be more accustomed to related terms such as kinesthesis or sense of movement (Batson, 2009).

A major milestone in a child's life is to no longer have to hold on to any of the surrounding surfaces to balance the body in an upright position and attain independent walk. In the process of achieving this, the child has to learn to use sensory information and motor action together to orient his or her presence in the environment (Austad & Van der Meer, 2007).

Balance, the process of integrating sensory input from multiple sources (vestibular, kinesthetic, tactile and visual) in order to plan and execute static and dynamic postures (Burton & Davis, 1992; Furman et al., 2000; Gallahue & Ozmun, 1995), is an integral part of almost every movement task a person may perform (Burton & Davis, 1992). In young children, balance is mainly influenced by vision, whereas in adults it depends on tactile and kinesthetic input (Crutchfield & Barnes, 1995; Horak et al., 1997; Woollacott & Shumway-Cook, 1989).

The kinesthetic perception is important in the learning process. The more the motion and skill are felt, the better the skill or/and motion are performed, which leads to increasing the performance level remarkably (Schmidt, 2000). The kinesthetic perception helps in improving the skilful performance and gaining new skills (Gordon & Diane, 2002). The kinesthetic perception is, also, important in general motor performance and more important in sports motor performance since it allows to control and correct the movement while it is performed either in terms of shape, extent or direction (Nichols, 1994). Quintana et al. (2007) found a positive and significant relationship between the skills of sight perception and the sports achievement level. Through the kinesthetic perception improvement increases in injury prevention, more awareness of where athlete is physically, internally and externally, improvements in performance, reduction in fear of failing and improvement in confidence, can be achieved (Lewis, 2016).

In addition, balance ability considerably influences learning and implementation of new skills, constitutes the basic factor for success in all athletic activities (McGuine et al., 2000) and is a reliable predicting factor regarding the development of basic motor skills such as walking, running, and throwing, academic success and risk of athletic injuries (Butterfield & Loovis, 1994). However, individual differences in ability prior to the acquisition of a criterion task limit learning (Kleinman, 1983; Magill, 1993). Thus, the level of competence development determines the differences between individuals in learning and performance in motor skills (Gallahue & Ozmun, 1995). It is worth to be mentioned that practice or experience appears to modify scores on abilities needed for skilled performance (Magill, 1993; Regnier & Salmela, 1987; Schmidt, 2000).

For elementary school pupils, such a practice can be achieved through the physical education course. Besides, the aim of physical education course in elementary school, among other, is to develop neuromuscular co-ordination, kinesthetic and audiovisual perception, flexibility, agility and balance, to promote health and well-being in pupils, etc. (Greek Pedagogical Institute, 2003). In addition, Greek traditional dance is an activity taught and performed at elementary school during the physical education course.

Several studies have examined the effectiveness of many training programs on improving the kinesthesis and balance skills of children, adults or elderly (Aman et al., 2014; Bologun et al., 1992; Carrafa et al., 1996; Castagna et al., 2005; Fong et al., 2016; Fotiadou et al., 2002; Han et al., 2015; Hao & Chen, 2011; Hewett et al., 2002; Lee & Park, 2013; Seidler & Martin, 1997; Wolfson et al., 1996). However, it appears that little research has been done to identify the effectiveness of Greek traditional dances on children's balance (Mavrovouniotis et al., 2007; Mavrovouniotis et al., 2013a), while no research to our knowledge has examined the effectiveness of Greek traditional dances on children's kinesthesis, indicating that there is a need for more systematic research.

For these reasons, the purpose of the present study is to examine the effects of a 12-week Greek traditional dances program on the development of kinesthesis and dynamic balance in school-aged children.

2. Method

2.1 Sample

All the children were pupils of two different elementary schools and were members of two different dancing clubs at the same geographical area. From the lists of the members kept in each dancing club, twenty four children aged 6-10 that were attended the first to the fourth grade of elementary school, twelve members from each dancing club, were randomly chosen. All the children fulfilled the inclusion criterion that is participating only in an, after school, group dancing program for learning and performing Greek traditional dances to the dancing club.

After that, a telephone communication/invitation was made to each student's parents, in regard to the research. In continuity, twenty one children volunteered to participate in the research. A written

informed consent for the participation in the research was obtained from the parents of all the participants. All the children had certification of medical control so that they could participate in physical education and sports.

Two subjects who were found to fulfil the exclusion criterion, that is extra, after school, participation in exercise programs and sports, were excluded from the research. In addition, at the end of the research, the data of two children were excluded because, due to illnesses or/and vacations, they missed more than two Greek traditional dances bouts. Finally, seventeen healthy children, six boys and eleven girls, were participated in the study and were studied for the purposes of the research.

2.2 Procedure

An approval for conducting the research was given from the committee of each dancing club, after the aim and the treaties of the research were described. Procedures were in agreement with the ethical standards of the Declaration of Helsinki of the World Medical Association (2000).

In order to assess only the effects of the Greek traditional dances program, the whole intervention program was carried out after the schools were closed, during the summer months. At the time of the program, the students did not attend any other exercise or sports program, except the program of Greek traditional dances and they were taking their time on free playing and talking to their friends.

Before the beginning of the research, a description of general requirements was given and the aim of the research was also described to the children and their parents, without any briefing relative to previous research findings. Particular emphasis was given on the need for regular participation of the children. It was, also, noted that a pupil who missed more than two Greek traditional dances bouts (2 absences out of 12 sessions), for any reason, would be excluded from the research.

Then the children participated in an afternoon group program of Greek traditional dances, each one to the club where he/she was member. The Greek traditional dances sessions to the different clubs were conducted by teachers of physical education with extensive practical experience. More specifically, the subjects of the present study followed a 12-week training program with Greek traditional dances at a frequency of 1 training session per week, for 90 min each session. The frequency of the Greek traditional dances sessions was the accustomed one to the clubs of Greek traditional dances.

The performed Greek traditional dances were from all Greek geographic areas. The program was designed according to certain basic dances, while the purpose was to enrich the program with a variety of dances, regarding the rhythm, the kinetic repertoire and the style. In order to begin dancing, the children were holding each other using a variety of handholds, creating a hemi-cycle or/and other formations. The dances that were performed included a variety of simple kinetic patterns with music accompaniment. More specifically, during the dances, the children performed small, moderate or long steps, slow, medium, fast or very fast steps, movements forward, back, right or left, one or more turns, rebounds on one or both legs, blows to the ground with one or both feet, stops on one or both legs. These movements of the lower limbs were in co-ordination with specific movements of the upper limbs such as forward, backward, upward movements, two-hand blows, clapping with two-hand, etc., always

under the accompaniment of music. The dances' intensity ranged from low to high, so that the subjects could keep dancing continuously throughout the dancing part. The duration of each dance was about 2.5 to 3.5 min. Essential breaks of approximately 10 sec in between dances were made in order to change dance and to give a feedback concerning the following dance.

For the selection of Greek traditional dances the following criteria were taken into account: a) The degree of difficulty, according to the children's skill level. b) Familiar, desirable and pleasant music for the children with the accompaniment of songs where it was possible. c) Simple steps and simple combinations of steps. d) Different formations and handholds according to each performed dance. e) Medium tempo.

During the conduction of the survey, the children had participated once a week in, an after school, 90-minute group program for learning and practicing Greek traditional dances for about 8 months. The specific period was chosen, because at this stage the children have learnt and could repeat a fairly large number of dances, find their pace, relax and become familiar with each other and of course do not focus solely on the simple execution of the steps but they leave aside the steps, since they know the dances and no longer need to measure steps.

All participants wore athletic shoes and sports clothes during each dance session. The instructor always stood in front of the participants providing continuously verbal and visual feedback and including extra description of the movements. The name of each dance helped the participants to memorize it more quickly. The instructor repeated key-words or more detailed verbal instructions, if she noticed that an individual had not followed an instruction.

The Greek traditional dances sessions and the kinesthesis and dynamic balance measurements were executed without problems at the indoor hall of the dancing club, an environment especially organized for Greek traditional dances performance. The test for the participants in the Greek traditional dances program included two measurements (initial and final), that were carried out before and after the application of the 12-week intervention program with Greek traditional dances.

2.3 Measurements

Physical measurements: Measurements of children's height and body mass were performed. Height was measured using a portable stadiometer, to the nearest 0.1 cm. Weight was measured using an accurate scale, to the nearest 100 g. All children removed their shoes and wear only light indoor clothing. Moreover, Body Mass Index (BMI) was evaluated (BMI=body mass/height^2).

Kinesthesis: Kinesthesis was assessed by the kinesthesiometer (Lafayette Instrument Co.). The kinesthesiometer of Lafayette was chosen because it provides reliable measurements. The degree of reliability of the kinesthesis test is r=.92 (Lafayette Instruments Co.). The measurement was carried out according the instructions. From a seated position, with the dominant forearm bent to the elbow joint, the subjects performed an arm extension at a 60-degree (60^o) angle. After two practice trials, eight trials were given with closed eyes. The same procedure was followed at the 45-degree (45^o) angle. Kinesthesis was evaluated by the average of the error in degrees from the 60^o angle for all eight

trials, the average of the error in degrees from the 45^o angle for all eight trials and the average of the error in degrees from the 60^o and 45^o angle for the total of 16 attempts.

Dynamic balance: Dynamic Balance was assessed by the stabilometer platform (Lafayette Instrument Co.). The stabilometer platform of Lafayette was chosen because a) it provides reliable operation and reliable measurements, and b) has been used in many researches for successful dynamic balance assessment (Lafayette Instruments Co.). The measurement was carried out according the instructions. Two electronic clocks recorded the duration of the trial (60 sec) and the subjects' balance time in sec. The performance clock stopped each time the platform deviated more than 15^o from horizontal. A practice of 30 sec was given before the initiation of the test. Dynamic balance was evaluated by the total balance time (sec) of the children on the stabilometer platform in accordance with the above conditions over the 60-second period.

2.4 Statistical Analysis

For the statistical analysis the Statistical Package for Social Sciences (SPSS) ver. 18.0 for windows was used. Calculation of the means and *SDs* of data was included using descriptive statistics. In addition, the non-parametric test Wilcoxon was used in order to compare the pre/post Greek traditional dances program values of kinesthesis and dynamic balance of children. The level of significance was set to $p<0.05$.

3. Result

The mean (m) and standard deviation (SD) of measured anthropomorphological characteristics of the children of our group are presented in Table 1. Moreover, the calculated BMI is presented in Table 1.

Table 1. Sample's Anthropomorphological Characteristics

Variables	**Experimental Group N=17**
Age (years)	7.94 ± 1.56
Height (cm)	131.29 ± 11.20
Weight (Kg)	30.59 ± 11.35
BMI (Kg/m^2)	17.33 ± 3.93

Note. Values are presented as *mean±SD.*

The fluctuation of the dynamic balance between the pre- and post- Greek traditional dances program measurements is shown in Figure 1.

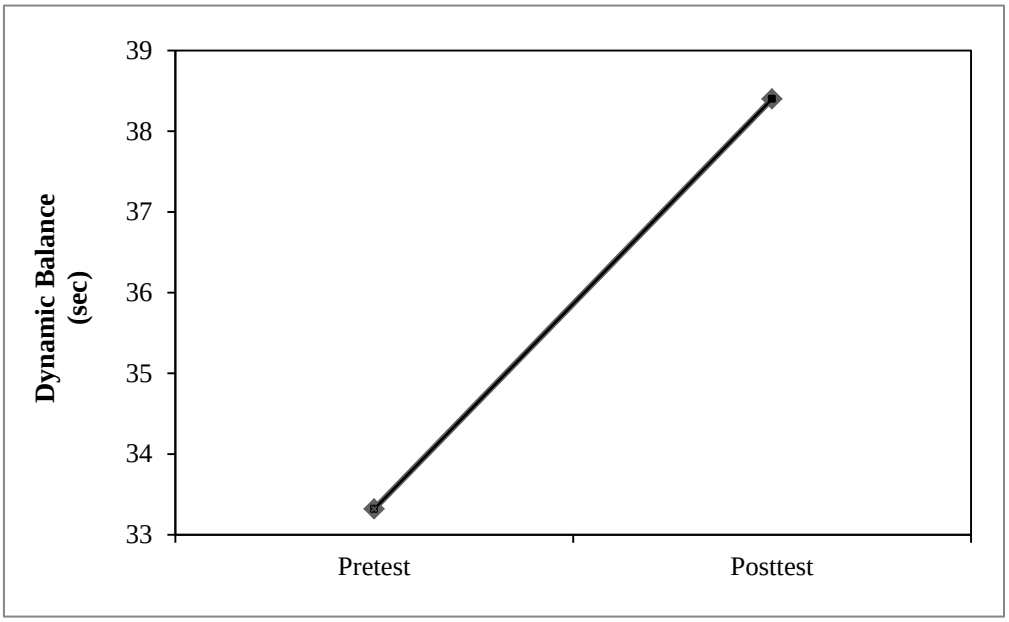

Figure 1. Dynamic Balance Scores Pre and Post the Greek Traditional Dances Program

As it is shown in Figure 1, dynamic balance followed a significant upward trend after the Greek traditional dances program. The fluctuation of the average deviations of the position of 45^{o} angle and of 60^{o} angle is presented in Figure 2.

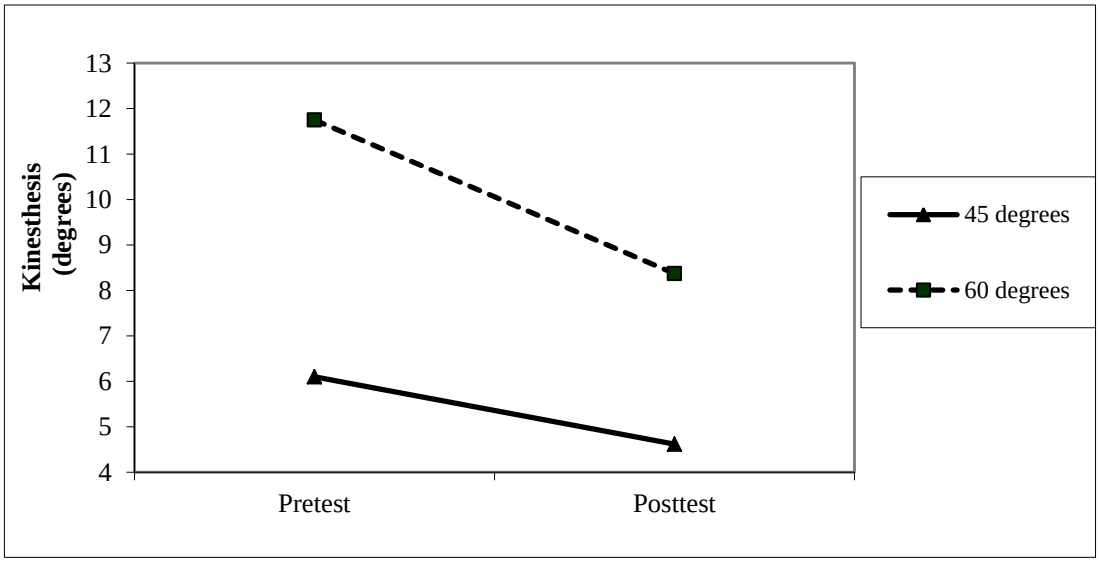

Figure 2. The Fluctuation of the Average Deviations of the Position of 45^{o} Angle and of 60^{o} Angle

As it is shown in Figure 2, the average deviations of the position of both angles followed a significant decrease after the Greek traditional dances program. Moreover, in Figure 3 is presented the total kinesthesis evaluated of the average deviations of the position of both angles 45^{o} and 60^{o}.

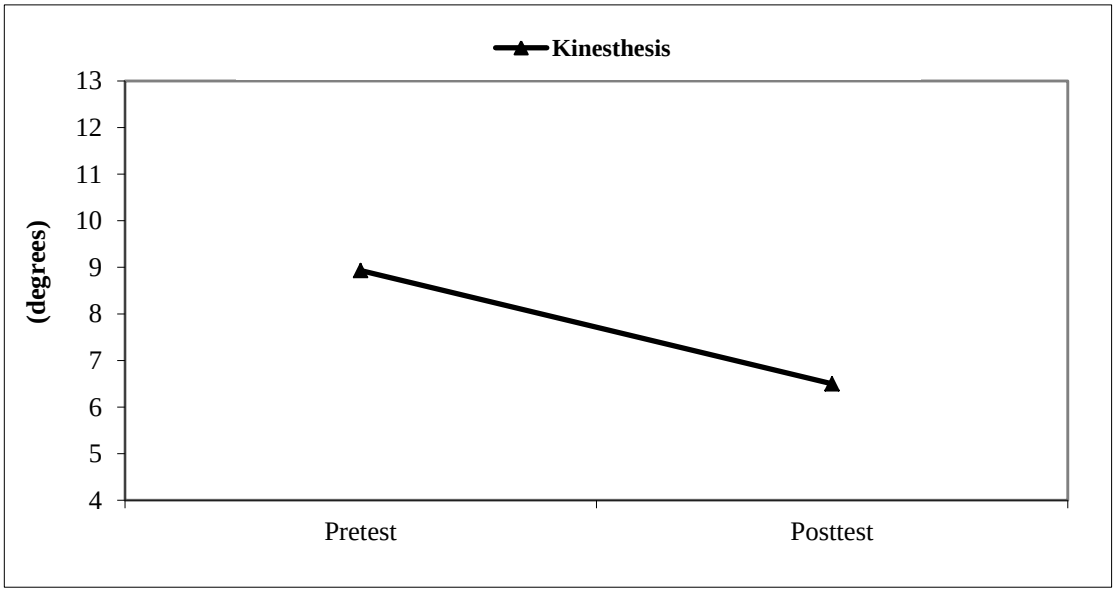

Figure 3. Kinesthesis Scores Pre and Post the Greek Traditional Dances Program

As it is shown in Figure 3, the total average deviations of the position of both angles followed a significant decrease, indicating that the total kinesthesis was increased after the Greek traditional dances program. In Figure 4 are presented the mean differences between pre and post program measurements for all variables.

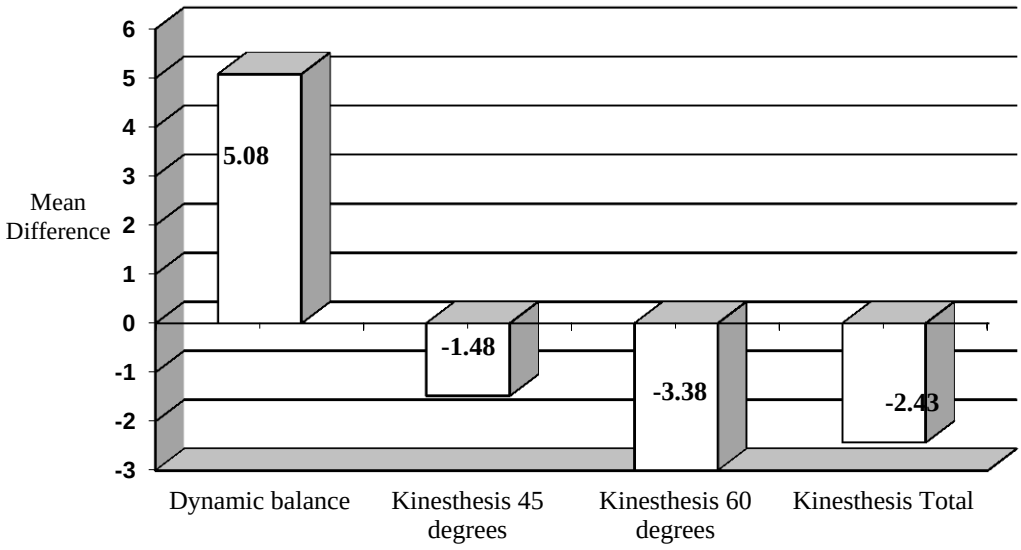

Figure 4. Mean Difference between Pre and Post Program Measurements

As it is shown in Figure 4, the time on the stability platform, as for the dynamic balance assessment, was increased, while the deviation from the position of the 45^{o} and 60^{o}, as well as the total, as for the

kinesthesis assessment, was decreased.

In addition, in Table 2 are presented the values of all the studied variables pre and post the program, as well as the statistical differences between the measurements before and after the Greek traditional dances program.

Table 2. Dynamic Balance and Kinesthesis Pre and Post the Greek Traditional Dances Program

Variable		Pre-program	Post-program	z & p
Dynamic balance (sec)		33.32±9.04	38.40±9.19	-3.29<0.001
Kinesthesis (degrees)	45^o	6.10±3.83	4.62±2.54	-1.99<0.05
	60^o	11.75±5.65	8.37±3.95	-1.99<0.05
	Total	8.93±3.03	6.50±2.31	-3.01<0.01

As it is shown in Table 2, the Wilcoxon test revealed that the children were significantly superior at the final measurement. Thus, after the 12-weeks Greek traditional dances program there was a significant improvement in terms of dynamic balance ability and kinesthesis ability (Table 2).

4. Discussion

From the results of the present study was found that both the examined psychomotor skills, kinesthesis and dynamic balance have been improved after the 12-week program of Greek traditional dances. In agreement with the present results, other researchers, who implemented other forms of dance, found improvements in kinesthesis and dynamic balance.

As for kinesthesis, Federman (2011) found an increase in kinesthetic ability among a group of Dance Movement Therapy trainees. Chatzopoulos et al. (2018) found that a creative dance program may enhance preschool children's proprioception. In addition, a training program containing a group of Tae Bo exercises, a form of high impact aerobics that combines the moves of tae kwon do, karate, boxing, ballet and hip-hop dancing, led to raising the level of the kinesthetic perceptions (perceptions of speed, motion, strength and distance) of University basketball team players (Roby, 2010). According to Shumway-Cook and Woollacott (2001), creative movement helps children to control their bodies and develop awareness of moving in a space with other children. Moreover, Goodill (1987) found that Dance Movement Therapy can help abused children, who misjudge their kinespheres, or personal space, to exercise control over that space, and regain a sense of control and ownership of their own bodies. Additionally, Chin (1988) found significant improvement in spatial awareness after Dance Movement Therapy in handicapped children.

Keun and Hunt (2006) observed the development of important aspects of the creative process throughout the integrated dance unit. Specifically, children consistently repeated shapes they had invented throughout the dance sequence, indicating a sense of ownership over the movement and form,

and a sense of kinesthetic achievement. More specifically, Keun and Hunt (2006) show that dance develops students' kinesthetic intelligence. Thus, creative dance can be considered as a unique body of knowledge relating to bodily-kinesthetic intelligence. Aiming at the free kinetic expression of ideas and feelings through the discovery of the body and in combination with the use of various objects in lessons, creative dance has a very close connection to bodily - kinesthetic intelligence (Michelaki & Bournelli, 2016).

In addition, Overby et al. (2005) consider dance uniquely suited to support conceptual learning, because dance's inherent interdisciplinarity helps to connect more abstract ideas to concrete and fundamental movement concepts. It can be argued that sympathetic communication through body movement is what makes the appreciation of dance possible (Hagendoorn, 2003). Dance can be thought of as a spatial extension of the body that reaches out and touches other bodies, just as the voice can be thought of as an aural extension (Boucher, 2004). Dancers, who have developed kinesthetic awareness or body awareness, are more likely to be able to perform the various movements of dance safely, to have a good sense of balance, and to respond to stimuli appropriately, as for example judge correctly where to move while dancing in a group (The Council of Ontario Drama and Dance Educators, 2018). Thus, dancing is a kinesthetic art form. Dancers enjoy kinesthetic thrills: thrills having to do with the experience of movement (https://www.vocabulary.com/dictionary/kinesthetic).

As for balance, dancers reveal better balance skills than no dancers (Gerbino et al., 2007; Mouchnino et al., 1992). In addition, Clary et al. (2006) found that ballates training improved effectively dynamic balance, while step aerobic dance and walking programs improved both static and dynamic balance. Undoubtedly, dance in the form of programs of movement sequences and creative dance, and of Dance Movement Therapy, too, affects positively the balance ability of children (Loeffler, 2007; Vuillerme et al., 2001), of children with Down's syndrome (Angelopoulou-Sakadami et al., 1995), of mentally retarded children (Boswell, 1993; Roswall & Frith, 1983; Smail & Horvat, 2005), of handicapped children (Chin, 1988), and of persons with balance problems (Kephart, 1971).

As for the implementation of Greek traditional dances program on children, the present results show a significant positive impact on children's dynamic balance. In agreement, other researchers showed positive effects of Greek traditional dances programs on the dynamic balance of children 6-18 years old (Mavrovouniotis et al., 2007), of girls 6-12 years old (Mavrovouniotis et al., 2013a), and of children with mental retardation (Tsimaras et al., 2012). Additionally, Mavrovouniotis et al. (2013b), who studied the effects of a combined training program with Greek traditional dances and pilates on blind children 15.67$\pm$1.32 years old, found significant improvements on static, as well as, on dynamic balance of the children. So, Greek traditional dances may affect positively children's static and dynamic balance. It could be said that practicing on dance, the performance of complex motor skills, requires a great sense of balance (Vuillerme et al., 2001).

But, how these improvements on balance happen? Dance, Tai chi, and other non-traditional exercise programs, that proved to improve balance, possess, among other, common characteristics such as the

use of slow, controlled movements with time spent in bipedal, unipedal and tandem stance, taking large steps forward, backward, laterally, and using both bilateral and unilateral upper extremities movements (Nnodim et al., 2006; Taylor-Piliae et al., 2010; Voukelatos et al., 2007).

Dancers maintain balance when turning by using a technique called spotting. The eyes focus on a stationary object and the head turns slightly ahead of the rotation of the body (Horvat et al., 2003). Dancers depend on their vision when learning to dance, in skills such as "spotting", or the delayed rotation of the head by fixed focus on one point when performing a pivot, are taught in order to assure balance and spatial orientation (Krasnow & Wilmerding, 2015). During a tandem stance the body is required to quickly focus its attention on controlling balance, preventing excessive sway (Sozzi et al., 2013).

As for the program with Greek traditional dances, it offered an environment, absolutely adapted to children's faculties. The program contained a variety of dances, regarding the rhythm and the kinetic repertoire. More specifically, the Greek traditional dances program included a variety of kinetic patterns, with a variety of steps, leg movements, directions etc, in co-ordination with specific and a variety of movements of the upper limbs, under the accompaniment of music. The performed Greek traditional dances' intensity ranged from low to high, depending on the children's capacities, with appropriate intervals from one dance to another and frequent rhythm alternations, so that the children could keep dancing continuously throughout the dancing part.

In addition, care was taken to respect individuals, so that they bring to the movement their abilities, their strengths and what they can share with others in the group. All children could feel a sense of belonging to a group and a sense of joy at being able to learn on a fundamental movement level. As a result, the children demonstrated a very positive attitude towards lessons, with an excellent level of participation (joy, attention, cooperation and satisfaction). Moreover, at the end of the training period, the children were allowed to dance free the most preferable dances, in order to feel the influence of Greek traditional dances, and this is an additional evidence of the program's effectiveness.

Besides, Greek traditional dance is an integral part of Greek culture. Moreover, it is one of the most indicative characteristics of temperament, history and the cultural identity of Greek people, because it is connected with the same spontaneous, instinctive expression of human mind and body. Greek traditional dance, music and song are not just social life expressions and depictions, but also organic and integral elements of social life (Filias, 1999). In various cultures dance is performed as an expression of emotion, sharing of stories and folktales and also as a form of exercise. The setting in which dance is represented can be within a spiritual setting or a theatrical performance setting. Dance can be a profession, entertainment and or simply a passion (Krasnow & Wilmerding, 2015). This is a feature of Greek culture, as well.

Through dance children are encouraged to explore and express themselves according to their own personality. No matter which form of dance the dancers participate in, posture, poise and grace are key factors. With this the dancer is constantly engaged, and is therefore trained indirectly in coordination,

balance, muscular strength and endurance, and holistically on motor fitness. If dance is performed as a routine it will then require remembering of steps and complex movement activating working memory (National Dance Education Organization, 2005).

Moreover, from the results of the present study the contribution of Greek traditional dances was proved. This is particularly important as Greek traditional dances are taught and performed at the elementary school and, as it appears, exert significant positive effects on the development of motor skills of elementary school-aged children. It is worth to be mentioned, that the philosophy of Greek traditional dances and of dance generally is similar to the aims of early childhood education programs, where opportunities for noncompetitive, success-oriented and creative experiences for young children are valued. By this mean, dance elements enable the integration of body, mind and spirit, and affect the perception of sensory input, especially kinesthetic, which may lead to cognitive awareness and maintenance of inner balance (Cassagne, 1990). In addition, an integral element of dance is music, which is an accessible accompaniment to either improvised or more structure movement sequences (Loeffler, 2007). Besides, it has been proved that rhythmical music improves walking co-ordination and movement proprioceptive control, leads in increase of stability and mobility, and helps in the expression of movement (Chen, 1985; Kravitz, 1994; Spilthoorn, 1986; Staum, 1983). Thus, dance is unique as it is both an art as well as an athletic activity. It is the art form that involves movement of the body in a rhythmical way (Krasnow & Wilmerding, 2015). Dance has been identified as an excellent way to develop various aspects in growing children, with the physical, emotional, social and cognitive maturation processes all being facilitated by dance. This is accomplished through a variety of movement patterns having been put together with synchronization and rhythm (National Dance Education Organization, 2005).

So, it could be said that dance seems to be an ideal activity for children and for athletes of various sports (Kravitz, 1994; Loeffler, 2007). Therefore, dance can be considered as a supplementary vehicle in the learning process and as an indispensable tool that facilitates self-actualization, especially the awareness of the body to appreciate its ability for movement, as well (Hottendorf, 1989; Wisher, 1979). In addition, dance experiences- added to the curriculum may increase student knowledge about a topic and, also, may improve student behaviors (Griss, 1994). Thus, when creative energy is aligned with learning objectives, a positive environment is created (Skoning, 2008).

In addition, according to the theory for the transfer of motor abilities, the capability for performance in one task could be a result of practice on some other tasks. So, based on the general motor ability hypothesis (Adams, 1987), the better sense of kinesthesis and balance as human motor skills, should remain observable among various tasks requiring kinesthesis and balance skills, and, also, could affect performance. Thus, so long as, there is a transfer of motor abilities from one task to another, Greek traditional dances may effectively constitute a subject or a part of the practice, at the specific age. Moreover, at this age, skills are being built, and children, parents, physical educator teachers and coaches, as well, are experimenting and testing what sport to look for in the future for either

championship or lifelong exercise.

Besides, the development of a person's perceptual motor skills, such as kinesthesis and balance, is very significant, as far as they are essential for the performance of any activity (Philips & Hornak, 1979). In addition, particularly in the younger age, the development of these skills creates an appropriate background for building the child's personality (Greek Pedagogical Institute, 2003). More specifically, the development of kinesthesis and balance leads to sports and academic success, personal awareness, increased confidence, and, also, plays a key role in children's experiences and psychological processes (Butterfield & Loovis, 1994; Lewis, 2016; Thelen, 1995). In addition, dance taps into something beyond language, a kinesthetic relationship to the world that is foundational to all later understanding. All children may therefore benefit from integration of creative movement into the school literacy curriculum (Brouillette, 2014). Furthermore, educators need to guide children's natural urge to dance movement and preserve their movement spontaneity into adult life. They, also, need to encourage children to learn and grow through movement and dance activities (Laban, 1948). Consequently, Greek traditional dances may play a significant role in the development of children's psychomotor skills, and sports performance, as well.

5. Conclusion

In conclusion, a program with Greek traditional dances with music accompaniment, could lead to significant improvements in children's abilities, kinesthesis and balance. Considering the importance of kinesthesis and balance for children's motor development, it is suggested that Greek traditional dances, as a form of physical activity, should constitute a part of exercise programs or a part of school physical education course that aim to the development of children's psychomotor abilities and skills. Of course these observations about the value of Greek traditional dances are preliminary. Besides, they concern the effects of a Greek traditional dances program on kinesthesis and balance ability and cannot be generalized to assess the effects on other abilities as well. In order to support these observations further validation research is necessary.

As a first systematic attempt to assess the effects of dancing Greek traditional dances on psychomotor abilities our study was limited to school-aged children. Despite the fact that the results were indicating positive effects on our sample's psychomotor abilities state, whether the findings reported here will generalize to other populations, such as preschool children, secondary education children, or young athletes of various sports and experience/level, remains unknown. Future research could extend the investigation to such populations.

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